

Distribution and Habitat Use of Steelhead and other Fishes in the Lower Feather River, 1999-2001

- interim report for SP-F10, Task 3A
- review and analysis of data on fish distribution, abundance and habitat characterization, based on field surveys in March through August
- final report will include 2002 and 2003 results; due December 2003
- chief preparer: Brad Cavallo, Division of Environmental Services, DWR
- reach him at (916) 227-0437 or bcavallo@water.ca.gov

Field survey methods

- survey area: between Fish Barrier Dam and confluence with Honcut Creek
- three survey scales--broad, intermediate, fine

(1) BROAD SCALE

- once a year, May/June
- from Fish Barrier Dam to Gridley Bridge
- recorded fish species, size and number, substrate, cover, habitat (riffle, pool, glide)

(2) INTERMEDIATE SCALE

- monthly, March through August each year
- 6 stations in LFC, 3 in HFC
- at least one riffle-pool sequence at each station
- data same as in broad scale, plus ten transects of depth, velocity, substrate, cover and habitat

(3) FINE SCALE

- monthly, March through August 2001
- 24 stations each month, 12 each in LFC and HFC, chosen at random from riffle-glide units
- each station 25m X 4m, parallel to bank
- recorded species, number, size, position
- recorded depth, velocity, substrate, cover and habitat type at 36 cells in a grid of 1 square meter cells
- fish observations recorded by cell; included fish depth and focal velocity

ALL SURVEY SCALES

- recorded temperature
- estimated age (YOY versus juvenile/adult) by size

MARK-RECAPTURE OF YOY STEELHEAD

- collected by seining
- summer 2002
- 4 stations in LFC
- each fish uniquely color marked
- measured weight and length
- documented residence time, movement, growth rate

RESULTS

(1) BROAD SCALE

- nearly all YOY steelhead and salmon were in LFC
- 85% of YOY steelhead were in uppermost mile
- juvenile and adult steelhead were all over LFC; few in HFC
- results for non-salmonids are in SP-F3.2 report

(2) INTERMEDIATE SCALE

- most YOY steelhead at Hatchery Ditch
- many at Auditorium Riffle
- most numerous in April
- juvenile and adult steelhead most numerous downstream in LFC
- salmon widespread in March, April; thereafter only in LFC

INTERMEDIATE SCALE (cont.)

- both species most often in glides and rare in backwaters
- both species most often in cover (small in-stream or overhead objects)
- smaller steelhead more often in slower water with cover near shore
- larger YOY steelhead more often in faster and open water away from shore
- similar shift with size for salmon

FINE SCALE

- YOY steelhead most often occurred:
 - in shallow water
 - near shore
 - with overhead cover
- YOY salmon most often occurred with:
 - small in-stream cover
 - overhead cover

STEELHEAD MARK-RECAPTURE

- 4.5% recaptured (19 fish out of 424)
- recaptures stayed close to home (3 recovered away from tagging site--all downstream)
- grew faster at downstream than upstream stations

IMPLICATIONS FOR PROJECT IMPACTS ON YOY STEELHEAD

(1) physical habitat simulation models may not predict habitat quality very well

- models (e.g. PHABSIM) express habitat in terms of depth, substrate, velocity and cover, as affected by flow
- but steelhead live mainly in shallows near shore
- amount of this habitat is not affected much by flow rate
- thus, flow management alone may not increase steelhead habitat

IMPLICATIONS FOR PROJECT IMPACTS ON YOY STEELHEAD

- (2) temperature regime in LFC has no obvious harmful effect
- LFC temperatures are within tolerance range (UC Davis research)
 - fish seem to grow faster at warm end of LFC than at cool end
 - fish seem to select and persist in warmer, downstream part of LFC
 - this is not what we would expect if fish at warm end were under heat stress